

BOOK REVIEWS

DESERT AEOLIAN PROCESSES edited by V. P. Tchakerian, Chapman and Hall, London, 1995. No. of pages: xiv + 326. Price: £45.00. ISBN 0-412-04241.

This multi-authored book is the most recent in a line of conference volumes published in the last ten years dealing with aeolian geomorphology, and beginning with the book with that title edited by Bill Nickling in 1986. Like that volume, this one stems from a conference in North America, containing papers given at the 1992 Association of American Geographers meeting. Thirty-seven authors contribute to 14 papers in Tchakerian's volume, covering a range of themes with a strong United States orientation. Eight of the papers are the result of research into aeolian processes and landscapes in the U.S., and although some of these are predominantly regional in emphasis, all contain developments, data and interpretations that add to the evergrowing font of aeolian knowledge.

The editor's own contribution is as co-author of one of the research papers, and as author of an introductory chapter that explains the resurgence of aeolian geomorphology in the late twentieth century. Measuring the history of research with a new absolute chronology, the Bagnoldian scale, Tchakerian spells out nine reasons for the recent rebirth of the study of the geomorphological role of wind. This chapter is succinct and will be a useful teaching reference.

Of the other 13 chapters, two deal with aeolian dust, two with wind erosion (specifically ventifacts) and one with aeolian modification of glacial moraines by sediment inputs and erosion. In fact, one of the papers on erosion, by Dorn, actually deals with the development of ventifacts on moraines and their potential use in relative dating, so that two papers are in the field of glacio-aeolian studies. The remaining papers all concern facets of sand transport and dune geomorphology. With the exception of the paper by Tsoar *et al.* on the changing character of linear dunes in the Sinai–Negev desert, which combines remote sensing and field study, all are from North America, but cover a range of

issues. Two concern the origin of sediment sources of specific North American sand seas, using geomorphological or geochemical techniques, and one provides an update on earlier work concerning the movement of barchan dunes in the Salton sand sea. While the combined data in this case cover an impressive 40 year period, it is somewhat odd that data terminate in 1981. One of the Salton barchans is subjected to detailed analysis of process and morphology in a further paper, by Mulligan.

A valuable paper by ten authors, fronted by Greeley, uniquely and innovatively utilizes radar remote sensing to assess the elusive z_0 over a range of natural desert surfaces in the U.S. If only we all had NASA in our cupboard of field equipment! Slightly fewer researchers contribute to another valuable paper combining field and remote sensing methods to determine sand transport pathways through the undulating terrain of the Mojave, describing on the way sand ramps, which are a potentially valuable source of palaeo-environmental information, given their combination of aeolian and slope deposits and palaeosols.

The collected papers in *Aeolian Geomorphology* demonstrate the diversity of themes, methods and issues dealt with by researchers interested in the way the wind shapes the landscape of drylands, and the vibrancy of the aeolian research agenda, which has matured into a dynamic and leading field within geomorphology. As for the book itself, though some of the papers are more novel and innovative than others (almost inevitable in a conference-derived volume), there is not a dud amongst them. Resorting to that favourite cliché of reviewers of such volumes, it may be relatively expensive and specialized, but it deserves a place on the library shelves. I will certainly be adding some of the papers to my teaching reading lists, while I have also gained some ideas for my own research.

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REGOLITH, SOILS AND LANDFORMS by Cliff Ollier and Colin Pain, John Wiley & Sons, Chichester, 1996. No. of pages: viii + 316. Price: £65.00 (hb). ISBN 0-471-96121-3.

This would seem to be the first book to provide a wide-ranging synthesis of the relationships amongst regolith, soils and landforms. Its authors have both been researching in this field for many years; Cliff Ollier is well known for his books *Weathering, Tectonics and Landforms* and *Ancient Landforms*, and Colin Pain has long worked on regolith and soils and is currently head of the Regolith Discussion Group

at the Australian Geological Survey Organisation. Thus, the authors are well qualified to write such a book. However, is there a need? A demand certainly seems to exist for synthesising information from a wide range of disciplines, and in this respect there is probably a need for a synthesis of regolith and landforms.

In general, this book satisfies this requirement, but with some reservations. The best chapters, such as those on 'Landforms and surficial sediments', 'Stratigraphy and age of the regolith', 'Tectonics and models of landscape evolution', 'Ores and geochemical exploration' and 'The big picture – regolith in the geosystem', are those where the book

truly tries to produce such an integration. However, the first part of the book is essentially a traditional and, in some cases, a simplistic and somewhat dated account of the nature and mechanics of rock weathering, hydrology and regolith, and climate and regolith. The chapter on 'Soils' is also rather light, but does give a general background.

The book is well written and presented with extremely clear illustrations and a number of black and white photographs. As the authors note in the preface, the regolith is a comparatively new area for study, and the general outlines of the subject are not agreed. Chemists, hydrologists and geomorphologists use different languages and have different

ideas and problems. This book has gone some way to addressing these issues. The authors suggest that it may have been premature to write such a book, but I do not believe this to be the case, as the book has established a reference point for future work. 'The courage to generalize is a virtue', and if no one is prepared to take the plunge, then advances in understanding will not be made. Ollier and Pain have taken the plunge and are halfway across the pool. The question is, will anyone catch them up?

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MORPHOLOGIC BEHAVIOUR OF A BARRED COAST OVER A PERIOD OF DECADES by K. M. Wijnberg, The Royal Dutch Geography Society/Faculty of Geographical Sciences, Utrecht University, Netherlands Geographical Studies 195, 1995. No. of pages: 245. Price: Dfl 45.00. ISBN 90-6809-211-1.

This book is the culmination of 5 years of detailed research on the coast of Holland, focusing mainly on morphological behaviour of large coastal stretches (tens of kilometres, termed 'large scale levels') over a time span of decades; on the relevant boundary conditions (covering hundreds of kilometres and termed 'mega scale levels') associated with coastal behaviour on these scales; and on the presumed relationship amongst spatial and temporal scales with respect to coastal behaviour. The bathymetric database utilized was the Dutch 'JARKUS' database, started in 1963/4, with coastal profiles being measured from the dune foot to approximately 1 km seaward, every 250 m alongshore except where groyne fields interposed. Cross-shore distances ranged from 10 to 20 m. This is a very impressive data set. The seven chapters follow a traditional path, with an introduction, study area location, methodology, two chapters on decadal and multi-year behaviour of multiple bar systems, followed by one outer bar degeneration and a conclusion. It is a dense, tightly packed analysis that makes for hard reading at times, and the

title is slightly misleading in that it deals exclusively with the Dutch coast. Many of the references bear witness to this and some notable papers are not listed. Empirical eigenfunction analyses have been extensively utilized to show that complex variations in nearshore morphology can be explained in terms of characteristic patterns recurring in particular time domains. The models described show growth and decay of barred areas related to changing wave climates, antecedent morphology etc., and a masterly account is given of bar degeneration. It is argued that decay of the outer bar top is irreversible and is not due to simultaneous filling of the landward trough, yet this sediment is entrained within the inner bar system and redistributed there! Wave asymmetry is the process responsible for degeneration, largely by progressive and standing edge wave motions in the infragravity band which are present in storm events. This book opens with a quote from Pope's (1704) *Windsor-Forest*, so it is apt that lines from Flecker's *The Golden Road to Samarkand* come to mind: 'We are the pilgrims, Master, we shall go, Always a little further . . . Across that angry or glimmering sea.' Wijnberg is a pilgrim and the book is an excellent addition to any library. It is compulsive reading not only for 'bar' people but for all researchers who work in 'that angry or glimmering sea'.

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ZOOGEOMORPHOLOGY by David R. Butler, Cambridge University Press, Cambridge, 1995. No. of pages: vii + 231. Price: £30.00 (hb). ISBN 0-521-43343-6.

Only a decade ago, biogeomorphology was a term rarely heard. Since then, the pre-existing trickle of works has become a stream. Notable for their impact during this period have been those books edited by Viles (1988), Thornes (1990) and Hupp *et al.* (1995). Of similar significance is this single-authored book, in which Butler seeks to explore the geomorphic effects of wild, natural or feral animals. He specifically excludes domesticated and agricultural animals, as well as coral reefs. Butler's zoogeomorphology is of the direct type: 'the roles of animals in eroding, transporting, and/or depositing or causing the deposition of rock, soil, and unconsolidated sediments'. He specifically excludes soil

bioturbation or pedoturbation and, implicitly, the indirect geomorphic effects therefrom.

Within the limits he sets, Butler has done a splendid job. The first thing I examine about a book is the bibliography and Butler has provided 33 small-print pages (well over 700 references) which seem to omit very little. Chapters are directed to invertebrates, ectothermic invertebrates, birds, digging, trampling, wallowing and mammalian burrowing, and the book concludes with Butler's perennial favourite for research, the geomorphic influence of beavers. In addition to the bibliography, there is a subject index of 12 pages. The book is attractive and well illustrated, the print is sharp, and the editing is top-notch.

Within his somewhat restricted scope, Butler has done an excellent job. He seems to have unearthed most sources, is insightful, and writes in an informed, first-person style that I find effective. He explores many implications and frequently